

NON-PUBLIC?: N  
ACCESSION #: 8912270264  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Arkansas Nuclear One, Unit One PAGE: 1 OF 3

DOCKET NUMBER: 05000313

TITLE: Reactor Trip on High Reactor Coolant System Pressure Which  
Resulted From the Inadvertent Closure of a Main Feedwater  
Isolation Valve Due to Personnel Error

EVENT DATE: 11/14/89 LER #: 89-038-00 REPORT DATE: 12/14/89

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 074

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION:  
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Larry A. Taylor, Nuclear Safety and Licensing Specialist

TELEPHONE: 501-964-3100

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:  
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On November 14, 1989 at approximately 2323, a reactor trip occurred as a result of the inadvertent closure of a main feedwater isolation valve. While attempting to close the suction isolation valve from the condensate storage tank to the steam driven emergency feed pump during MOVATS testing, a licensed plant operator inadvertently closed the main feedwater isolation valve for the "B" steam generator. This action caused the "B" main feedwater pump to trip on high discharge pressure and resulted in a reactor trip due to a high Reactor coolant System (RCS) pressure of 2355 psig. The initial plant response following the trip was normal. However, due to various steam leakage paths in the secondary system, steam generator pressures gradually decayed to 935 psig and 891 psig for the "A" and "B" generators respectively. RCS temperature

decreased to 540.2 degrees. These values are slightly below those normally anticipated during post trip conditions. The root cause of this event was personnel error in that the operator failed to ensure that he was manipulating the correct valve. Disciplinary action was taken against the operator responsible for manipulating the wrong valve. In addition, a Secondary Systems Evaluation Team was formed to identify and recommend corrective actions for secondary system deficiencies. Significant deficiencies were corrected during mid cycle outage 1M89, which is presently in progress.

END OF ABSTRACT

TEXT PAGE 2 OF 3

#### A. Plant Status

At the time of this event, Arkansas Nuclear One, Unit 1 (ANO-1) was operating at approximately 74 percent of rated power. Reactor Coolant System (RCS) AB! pressure was 2150 psig and RCS average temperature was 579 degrees. The "D" reactor coolant pump was out of service due to an oil leak.

#### B. Event Description

On November 14, 1989, at approximately 2323, a reactor trip occurred as a result of the inadvertent closure of the main feedwater isolation valve (CV-2630) for the "B" Once Through Steam Generator (OTSG).

While attempting to close the suction isolation valve from the condensate storage tank to the steam driven emergency feedwater pump (CV-2802) during MOVATS testing, a licensed plant operator inadvertently closed CV-2630, the main feedwater isolation valve for the "B" OTSG. This action resulted in main feedwater pump (MFWP) P-IB tripping on high discharge pressure. The reduced feedwater flow caused a decrease in heat transfer capability, which resulted in an increase in RCS temperature and pressure. Although the operators attempted to control RCS pressure by manually initiating full pressurizer spray and opening the pressurizer electromagnetic relief valve (ERV), a reactor trip was initiated by the Reactor Protection System (RPS)JC! at an RCS pressure of 2355 psig. An operator had also been immediately dispatched to try to stop CV-2630 from fully closing by opening its circuit breaker. Although there were no security barriers which significantly impeded the operator's action, there was not sufficient time for him to prevent the valve from closing. The initial plant response following the trip was as

expected with all post trip parameters being normal. However, due to various steam leakage paths in the secondary system, the OTSG pressures gradually decayed (approximately 37 minutes) to 935 psig and 891 psig for the "A" and "B" OTSGs respectively. The decrease in OTSG pressures in turn caused RCS average temperature to decrease to 540.2 degrees. These values are slightly below those normally anticipated during post trip conditions (pressure - 1005 psig, temperature - 545 degrees).

The major contributor to the OTSG pressure degradation and associated RCS cooldown was steam leakage through the moisture separator reheater (MSR) isolation valves, then through manually positioned MSR distiller level control valves to high pressure

heaters E-1A and B. The relief valves on the shell side of the high pressure heaters lifted, relieving steam to the atmosphere. Other sources of steam leakage included the feedwater pump turbine stop and governor valves, and the main turbine bypass valves.

The operators recognized the abnormal plant response and took timely corrective actions to isolate the various steam leakage paths and stabilize the plant in the hot shutdown condition.

At 0042 on November 15, 1989, reactor startup was commenced. The main turbine was tied to the grid on November 15 at 1254.

### C. Safety Significance

During this event, a reactor trip was initiated at an RCS pressure of 2355 psig, as required, and all control rods inserted. All plant parameters remained within normal bands with the exception of OTSG pressures and RCS average temperature, which were slightly lower than normally anticipated during post trip conditions. The operators took timely and appropriate corrective actions to stabilize the plant in the hot shutdown condition. Although the malfunctioning of secondary system components complicated the operator's post trip responses, they did not create any significant safety problems. Therefore, the safety significance of this event is considered minimal.

### D. Root Cause

The root cause of this event was determined to be personnel error. Although the valve operating hand switches for CV-2802 and CV-2630 are in close proximity to each other, the operator failed to ensure that he was operating the correct valve.

TEXT PAGE 3 OF 3

#### E. Basis for Reportability

This event is reportable pursuant to 10CFR50.73(a)(2)(iv) as an automatic actuation of the RPS.

This event was also reported in accordance with 10CFR50.72 on November 15, 1989 at 0026.

#### F. Corrective Actions

Disciplinary action was taken against the operator responsible for manipulating the wrong valve. Additionally, senior management personnel were placed on shift from November 15 until Monday, November 20 to observe plant operation and to collect feedback from Operations personnel with respect to problems associated with the plant and/or work environment. During this time, a reduction in maintenance activity was in effect in which only Technical Specifications or safety related maintenance was performed.

As a result of the post trip complications caused by secondary system equipment problems during this and a previous trip, which occurred on November 10, 1989 (LER 50-313/89-037-00), a Secondary Systems Evaluation Team was formed at the direction of the Vice President, Nuclear OPS, to address problems associated with the operation of various ANO-1 secondary systems. This team consisted of senior personnel from various disciplines as well as two representatives of other utilities. Its objectives were to identify the long standing material problems on the ANO-1 secondary plant that created the need for operator compensatory actions during transients. The problems were addressed individually and on an Integrated system operation basis considering plant impact in terms of performance, post trip activity, personnel safety and other considerations.

As a result of these evaluations, six of the deficiencies were identified as significant enough to require correction prior to restart. These six deficiencies were:

- o Main Steam Turbine bypass valves do not fully close.
- o Feedwater pump turbine high pressure stop and governor valves leak.

- o Main steam isolation valves to the second stage moisture separator reheater coils leak excessively.
- o Moisture Separator reheater distiller level controllers are inoperable.
- o Heater drain tank T40 high level dLEP valves leak excessively.
- o Main feedwater pump recirculation valves leak excessively.

Appropriate interim or permanent corrective actions were implemented with respect to each of these deficiencies and for many of the less significant items. The remaining items will be addressed during future outages.

#### G. Additional Information

Previous similar events in which reactor trips were caused by personnel error were reported in LERs 50-313/87-005-00 and 50-313/88-018-00.

Energy Industry Identification System (EIIS) codes are indicated in the text as XX!.

ATTACHMENT 1 TO 8912270264 PAGE 1 OF 1

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December 14, 1989

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U. S. Nuclear Regulatory Commission  
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SUBJECT: Arkansas Nuclear One - Unit 1  
Docket No. 50-313  
License No. DPR-51  
Licensee Event Report No. 50-313/89-038-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(iv), attached is the subject report concerning a reactor trip on high Reactor Coolant System pressure which resulted from the inadvertent closure of a main feedwater isolation valve due to personnel error.

Very truly yours,

E. C. Ewing  
General Manager,  
Technical Support and Assessment  
ECE/RHS/sgw  
attachment  
cc: Regional Administrator  
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